

ENVIRONMENTAL IMPACT STATEMENT

Pursuant To: Montana Environmental Policy Act
Section 69-6504 (b) (3)

PROJECT NO. FG-30

INTRODUCTION OF SPOTTAIL SHINER (Notropis hudsonius)
INTO FORT PECK RESERVOIR

December 10, 1981

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I. PURPOSE

Current data to evaluate forage fish abundance and reproduction in Fort Peck Reservoir indicates a substantial decline in emerald shiner numbers since 1977 and a general reduction in yellow perch abundance; other forage minnow species also appear to be relatively scarce. A very similar situation exists in the other large Missouri River mainstem reservoirs located in North and South Dakota.

It is therefore the purpose of the Department of Fish, Wildlife and Parks to introduce a new minnow species, the spottail shiner (Notropis hudsonius), into Fort Peck Reservoir to augment the forage base for game fish populations.

II. DESCRIPTION OF PROJECT

It is anticipated that several thousand spottail shiners will be introduced in Fort Peck Reservoir over at least a two-year period. These fish will be trapped through cooperation of the North and South Dakota game and fish agencies during the spring and transported to Fort Peck Reservoir. They will be released in areas which are considered favorable habitat for this species. Periodic evaluation of the plants will be made by beach seining and trapping.

III. DESCRIPTION OF EXISTING AQUATIC ENVIRONMENT

Fort Peck Reservoir is a 40-year old impoundment located in the upper Missouri River Basin in northeast Montana and is the largest body of water in the state. The multiple purpose uses of the project are flood control, navigation, and hydroelectric power. Other uses include water supply,

water quality control, recreation and fisheries. The State of Montana has classified the reservoir as suitable for domestic water supply, swimming, and other water-based recreation. Morphometric data pertinent to Fort Peck Reservoir are listed below in Table I.

TABLE I
PERTINENT MORPHOMETRIC DATA

Normal Operating Pool*	2,246 MSL**
Storage	17,900,000 ac. ft.
Surface Area	240,000 surface ac.
Average Depth	76 feet
Maximum Depth	220 feet
Average Annual Inflow	9,900 cfs
Theoretical Water Exchange Rate	635 days
Shoreline Length	1,520 miles
Length	135 miles
Average Width	3 miles
Average Annual Fluctuations Since 1966	9 feet

*Pertinent data based on this elevation.

**MSL = mean sea level.

This reservoir is classified as dimictic, freely circulating in the spring and fall, directly stratified during the summer and inversely stratified during the winter. Nutrient concentration in the lake waters indicate that Fort Peck is in the meso-eutrophic range in terms of phosphorus concentrations and in the ultra-oligotrophic range in terms of inorganic nitrogen concentrations. The available data on this reservoir indicates

that water quality is excellent although visual observations and chemical data indicate that some degradation may be occurring.

There are two major tributaries to Fort Peck Lake, the Missouri and Mussellshell Rivers, and a myriad of minor tributaries of which Big Dry Creek is considered as being the most important from the fisheries standpoint. Annual sediment inflow from these streams is estimated to be around 17,500 acre feet.

Forty-one species of fish are presently found in Fort Peck Lake of which 12 have been introduced since the formation of the reservoir. A list of the fish species that have been collected from Fort Peck is given in Table II.

TABLE II
A LIST OF FISHES FOUND IN FORT PECK RESERVOIR

<u>Common Name</u>	<u>Scientific Name</u>
1. Pallid sturgeon	Scaphirhynchus albus
2. Shovelnose sturgeon	Scaphirhynchus platyrhynchus
3. Paddlefish	Polyodon spathula
4. Goldeye	Hiodon alosoides
5. Mountain whitefish	Prosopium williamsoni
6.* Coho salmon	Oncorhynchus kisutch
7.* Kokanee	Oncorhynchus nerka
8.* Rainbow trout	Salmon gairdneri
9.* Brown trout	Salmo trutta

Common Name	Scientific Name
10.* Lake trout	Salvelinus namaycush
11.* Northern pike	Esox lucius
12. Carp	Cyprinus carpio
13. Flathead chub	Hybopsis gracilis
14. Lake chub	Couesius plumbeus
15. Emerald shiner	Notropis atherinoides
16. Sand shiner	Notropis stramineus
17. Brassy minnow	Hybognathus hankinsoni
18. Plains minnow	Hybognathus placitus
19. Silvery minnow	Hybognathus nuchalis
20. Fathead minnow	Pimephales promelas
21. Longnose dace	Rhinichthys cataractae
22. River carpsucker	Carpiodes carpio
23. Blue sucker	Cycleptus elongatus
24. Smallmouth buffalo	Ictiobus bubalus
25. Bigmouth buffalo	Ictiobus cyprinellus
26. Shorthead redhorse sucker	Moxostoma macrolepidotum
27. Longnose sucker	Catostomus catostomus
28. White sucker	Catostomus commersoni
29.* Black bullhead	Ictalurus melas
30. Channel catfish	Ictalurus punctatus
31. Stonecat	Noturus flavus
32. Burbot	Lota lota
33. Plains killifish	Fundulus kansae
34.* Bluegill	Lepomis macrochirus

<u>Common Name</u>	<u>Scientific Name</u>
35.* Smallmouth bass	Micropterus dolomieu
36.* White crappie	Pomoxis annularis
37.* Black crappie	Pomoxis nigromaculatus
38. Yellow perch	Perca flavescens
39. Sauger	Stizostedion canadense
40.* Walleye	Stizostedion vitreum
41. Freshwater drum	Aplodinotus grunniens
*Introduced	

IV. EVALUATION OF ENVIRONMENTAL IMPACT

A-B. Impact and Unavoidable Effects of Proposed Introduction

The introduction of spottail shiners into Fort Peck Reservoir is anticipated to have little overall effect on the fisheries or the aquatic environment of the reservoir. This species was planted in Oahe Reservoir, South Dakota, and Garrison Reservoir, North Dakota. It is now considered abundant in Oahe Reservoir and is heavily utilized by predator species such as walleye and northern pike; results have been about the same in Garrison Reservoir. These reservoirs are similar in size, water quality, and physiography to Fort Peck and it is probable spottails would also do well here.

This minnow species is not native to the Missouri River drainage. Although spottails are found in large rivers with low turbidities, they avoid strong currents and attain their greatest abundance in lakes and seem to prefer this type of habitat. Cover does not appear to be a limiting factor of spottail abundance in Missouri River

impoundments. They are predominately a schooling, shoreline-oriented species, although young-of-the-year spottails may also be found in open areas of lakes. Adults school in shallow water but occasionally move into deeper waters.

Spottails are sexually mature by a length of 2.6 inches. They spawn over gravel and sandy shores, and aquatic vegetation from May through July in various areas of their range. Fecundity averages about 1,800 eggs per female, with a range of 100-2,600 eggs.

Maximum growth for spottails is about 5 inches and they apparently do not live past the age of 4 years. Typical growth is as follows: Age 1 = 2.0 - 2.3 inches; Age 2 = 3.1 - 3.7 inches; Age 3 = 3.7 - 4.3 inches; Age 4 = 4.1 - 4.5 inches. Females generally live longer and attain a larger size than males.

This species utilizes a wide variety of food, apparently selecting whatever food is most abundant. Age 0 fish feed on algae and rotifers until they are about $\frac{1}{2}$ inch in length. Zooplankton is the main food of spottails $\frac{1}{2}$ -2 $\frac{1}{2}$ inches long. Adults larger than 2 $\frac{1}{2}$ inches feed on insects, zooplankton, water mites, algae, fingernail clams, fibers, and seeds of plants, and also eggs and larvae of their own species. A food habit study that included young-of-the-year walleye, yellow perch, crappie, and spottail shiner found only insignificant inter-specific competition for food. There is no evidence in the literature that adult spottails are detrimental to young game fish. Their benefit as forage outweighs any possible harmful effects they might exert on game fish populations.

Spottails are a preferred food of walleye, northern pike, smallmouth bass, and channel catfish in Canada. They are a heavily used food source for walleye less than 13 inches long in Minnesota lakes which also contain an abundance of other forage species. When Age 0 walleye switch from a diet of zooplankton to fish, they feed primarily on spottails in these Minnesota lakes. In Oahe Reservoir, walleye, sauger, crappie, and northern pike have turned to a diet of predominately spottails since this species became abundant.

There is some possibility that once spottails have been introduced into Fort Peck and become abundant, they may migrate into tributary streams of the reservoir such as the Musselshell and Missouri rivers and possibly their tributaries. However, according to life history studies of this species, they prefer a lake or reservoir habitat, but have been found in large rivers with low turbidities. The two major tributaries of Fort Peck are both quite turbid during much of the year and it would ^{not} seem spottail abundance would become a major factor of importance in these river systems. Also, spottails will probably go through Fort Peck dam and may find favorable habitat conditions in the dredge cut complex located in the immediate area below the dam. Since this area is lacking in forage fish and contains good populations of game fish, this could be considered beneficial. One other factor which should be considered is that spottails have been present in Garrison Reservoir for several years but their presence has not been recorded to date within the Missouri River in Montana.

C. Alternatives

One alternative is not to introduce spottail shiners in Fort Peck Reservoir. This obviously would preclude any benefits to game fish populations by providing an additional forage base.

Another alternative is to introduce some other forage species. However, there does not appear to be any other non-native forage minnow which has the favorable life history characteristics demonstrated by the spottail shiner and which is adapted to this latitude and longitude.

D. Short-term Versus Long-term Use

The introduction of spottail shiners must be considered as a long-term usage. It is probable several years will be required before significant numbers of spottails are present to provide an adequate forage supply and there is also the possibility this species may remain relatively unimportant due to predators, competition, adverse changes in habitat, or other factors.

E. Irreversible and Irretrievable Commitment of Resource

The introduction of spottail shiners into Fort Peck Reservoir and the establishment of a viable population will result in an irreversible and irretrievable commitment since there would be no practical method of eliminating this species once planting occurs.

F. Discussion of Problems and Objections by Other Agencies or the Public

It is anticipated few if any problems or objections will be registered by other agencies. This minnow species has many of the desirable characteristics needed to augment the forage base for walleye and northern pike and few, if any, undesirable traits which would cause concern regarding this introduction. Little, if any, objection is expected from the public since many area fishermen and local community organizations have expressed interest in planting additional forage species in Fort Peck.

V. BENEFITS

The primary benefit of spottail shiner introduction is the possibility, based on experiences in Garrison and Oahe reservoirs, this species will become abundant and provide an additional and needed supply of forage for predator species in Fort Peck Reservoir.

VI. PUBLIC HEARINGS

No public hearing is contemplated. If sufficient interest is shown during the review process and a request for a hearing made, this decision will be reconsidered.

VII. SUMMARY STATEMENT

Options to increase forage fish production in Fort Peck Reservoir are rather limited due to a number of factors. Unstable water levels, frequent heavy wave action and associated high turbidities, and a general paucity of littoral areas combine to severely restrict the establishment of permanent shoreline aquatic vegetation. Flooded shoreline vegetation and aquatic

vegetation are extremely critical for reproduction and also provide nursery and refuge areas for many of the fish species present in Fort Peck. A general decline in the overall forage base in this reservoir has been documented over the past years and it is reasonable to assume this decline is associated with large populations of predator species combined with constantly changing reservoir conditions. The other Missouri mainstem reservoirs have also experienced similar declines in forage abundance and have taken steps to alleviate this problem. The success of spottail shiner plants in Oahe and Garrison reservoirs and lack of any documented problems associated with this species makes it a prime candidate for introduction into Fort Peck Reservoir.

VIII. This draft environmental impact statement was prepared by Dr. James Liebelt who is presently Regional Information Officer for Region 6 in Glasgow. Prior to this, he was project leader for the Fort Peck Reservoir fisheries studies for a period of ten and one-half years. Dr. Liebelt received a B.A. in Biology from Concordia College, Moorehead, Minnesota, in 1960. He completed his requirements for a M.A. in Zoology in 1967 and a Ph.D. in Zoology, in 1970. Dr. Liebelt holds the American Fisheries Society's certification as a fisheries scientist.

IX. LIST OF MAILING DISTRIBUTION

Dr. Daniel Block, Western Montana College

Mr. Lee Denson, Bureau of Reclamation

Mr. Hank Fisher, Defenders of Wildlife

Dr. Louis W. Hagener, Northern Montana College

Mr. Ray Hoem, Bureau of Land Management, Billings
Mr. James Phelps, Montana Audubon Council
Dr. Norm Schoenthal, Eastern Montana College
Dr. Andy Sheldon, University of Montana
Dr. George Weisel, University of Montana
Dr. James White, Montana State University
Bureau of Land Management, Area Director
Circle Rifle Club
Department of Natural Resources and Conservation
Environmental Information Center
Environmental Quality Council

Fort Peck Forward
Governor's Office
Hill County Wildlife Association
Lower Yellowstone Outdoor Association
Miles City Rod and Gun Club
Montana Cooperative Fishery Research Unit
Montana Wildlife Federation
Student Environmental Research Center, University of Montana
Trout Unlimited
U.S. Army Corps of Engineers
U.S. Fish and Wildlife Service, Area Director
Wolf Point Rod and Gun Club

Regional Fish Managers, Fish, Wildlife & Parks Department
Ecological Services Division, Fish, Wildlife & Parks Department

